



Value for Money in Hospital Facilities Management: The Evidence

By Amir Mohammadi, Alex Murray and Andrew Edkins

The Infrastructure Forum in partnership with University College London
The Bartlett School of Construction and Project Management University College London



October 2013

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Introduction

There continues to be debate around public sector infrastructure procurement and service provision and, as part of this, the implications of private sector service delivery. This is especially critical within a climate of public sector efficiency savings and value for money objectives.

The United Kingdom (UK) has often been regarded as the test bed for the rest of the world when it comes to using output-based, long-term service contracts, mainly under the PFI¹ procurement approach. In addition, for many years, there has been widespread outsourcing of soft FM² contracts to private providers from historically public sector in-house service provision. The National Audit Office (NAO) has raised concerns about the lack of benchmarking of these services, especially in respect of privately financed social infrastructure³.

"It is extremely important to develop the body of objective research into the performance of the private sector in the provision of services rather than needing to rely on unsubstantiated feedback, anecdote and materials produced by those whose attitudes on the private sector and PFI are not supported by evidence."

Graham Mather
The Infrastructure Forum

In 2011, Government initiated a fundamental reassessment of PFI that concluded with the publication in December 2012 of "A New Approach to Public Private Partnerships"⁴ and "Standardisation of PF2 Contracts"⁵. One of the reform measures introduced in PF2 was "to improve the flexibility, transparency and efficiency of services, soft services such as cleaning and catering will be removed from projects", (page 13, 2012). Whilst there is universal support for the improvement of flexibility, transparency and efficiency, there has been relatively little comparative evidence published about the results of in-house provision compared with outsourcing. Nevertheless, the Government's publications include statements such as "In the past contractors have typically included a risk premium in the pricing of soft service provision. However, the actual costs may have been lower than forecast, thereby reducing the scope and the degree of risk pricing in the sub-contracts" (page 35, 2012), and evidence from respondents to the initial call for evidence on the strengths and weaknesses of PFI suggesting that the removal of soft services would "improve value for money".

¹ In this publication Private Finance Initiative (PFI) is used to refer to a specific form of Public Private Partnership (PPP) used in the UK. This involves the private sector taking responsibility for designing, building, financing and operating a facility typically for 25 years or more.

² Soft FM refers to the services required to operate a facility such as cleaning, catering, security and reception services, as opposed to hard FM which involves the maintenance of the physical fabric of the building.

³ NAO, 2010: The performance and management of hospital PFI contracts.

⁴ HM Treasury, 2012: A new approach to public private partnerships (Available at: http://cdn.hm-treasury.gov.uk/infrastructure_new_approach_to_public_private_partnerships_051212.pdf)

⁵ HM Treasury, 2012: Standardisation of PF2 contracts (Available at: http://cdn.hm-treasury.gov.uk/infrastructure_standardisation_of_contracts_051212.pdf)

Against the background of this debate, the new PF2 model and the proliferation of other models for delivering outsourced support services to hospital trusts, there is a deficiency of research into which approaches generally deliver greater value. This is why The Infrastructure Forum, in partnership with UCL, seeks to provide objective evidence in regard to the performance of these services. This is to address the paucity of analysis of data and quality of information available on operational performance and cost of infrastructure generally. We hope through this collaboration and groundbreaking work, through the systematic analysis of data, we can provide an objective evidence base to support future procurement decisions around how publicly funded serviced facilities are operated.

This report puts **hospitals** in the spotlight. It examines the operational cost and performance of service provision including cleaning and catering, as well as aspects of the patient environment, provided by the public and private sectors. This study progresses earlier work⁶, comparing services provided under PFI compared to non-PFI provision. Additional data on outsourced services has since been applied to broaden the scope of this analysis. Here we examine private sector performance, be it part of a PFI contract or outsourced services, in comparison with FM services provided in-house by the NHS. Our report presents an analysis of publicly accessible data and a review of the findings.

"We have vast experience of providing soft services in a variety of public buildings, including hospitals, and these conclusions do not come as a great surprise to us. We would like to see the Government's analysis of where private sector provision suffers in relation to flexibility, transparency and efficiency and understand whether the Government's conclusions outweigh the conclusions reached in this report."

Simon Henbest
Interserve Support Services

The Study

This study looks at cleaning and catering service provision in hospitals. Additionally, aspects of the patient environment are considered. We use as measures of performance patient environment ratings, cleanliness scores and cost of cleaning per metre squared of occupied floor area as data that are in the public domain. Patient environment ratings reflect the quality of cleaning as well as the availability and maintenance of certain facilities such as hand-wash basins. Cleaning scores relate specifically to the quality of cleaning.

It builds on a previous paper analysing the operational performance of hospitals produced by KPMG in collaboration with UCL – "Operating healthcare infrastructure – Analysing the evidence". Additional data has now been made available on whether services are outsourced, allowing us to tell whether provision is 'private'⁷ or 'public'⁸ sector. Until now, the data required to accurately observe whether some PFI facilities services had been retained 'in-house' or not was not publicly available⁹.

⁶ KPMG, 2010: Operating healthcare infrastructure - Analysing the evidence, & KPMG, 2010: The impact of school renewal - Analysing the evidence.

⁷ 'Private' group comprise services outsourced by the NHS to the private sector as well as services within the scope of an integrated PFI contract.

⁸ 'Public' group pertains to services provided by the NHS 'in-house'; it incorporates both publicly and privately procured facilities. These samples also included PFI facilities where core soft FM services have been retained 'in-house'.

⁹ Around one third of PFI facilities have core soft FM services outside of the scope of the PFI contract (NAO, 2010). In the main, these services are retained in-house by the NHS and not often then 'outsourced'. (PEAT, 2010 data: www.nrls.npsa.nhs.uk/patient-safety-data/peat).

The sources from which data were gathered include: NHS Hospitals and Estate Facilities Statistics (HEFS), Patient Environment Action Team (PEAT), National Audit Office (NAO), HM Treasury, Partnerships UK (PUK), Infrastructure UK (IUK) and Department of Health (DoH).

This report examines the following:

- An analysis of the patient environment, as an indicator of the performance of cleaning services.
- The NHS National Specification of Cleanliness (NSC) scores for facilities in which the two alternative delivery types, public and private, are in place.
- Data on the cost of cleaning to provide a first level insight into Value for Money by delivery type.
- Catering performance and cost.

Our main findings are:

- Privately serviced facilities have better patient environment ratings than publicly serviced facilities. However, the NHS NSC scores are seen to be similar between the alternative delivery types.
- The cost of cleaning for privately serviced facilities appears to be statistically similar to that of publicly serviced facilities. However, the average cost of cleaning in publicly serviced facilities is around 10% lower than that in privately serviced facilities.
- The catering cost for privately serviced facilities is significantly lower than that of publicly serviced facilities. There is no difference in the catering ratings between the alternative delivery types.

Patient Environment Ratings

Does the method of operating healthcare infrastructure influence the non-clinical aspects of healthcare environments – including cleanliness?

We have attempted to inform this debate by using existing data on patient environments.

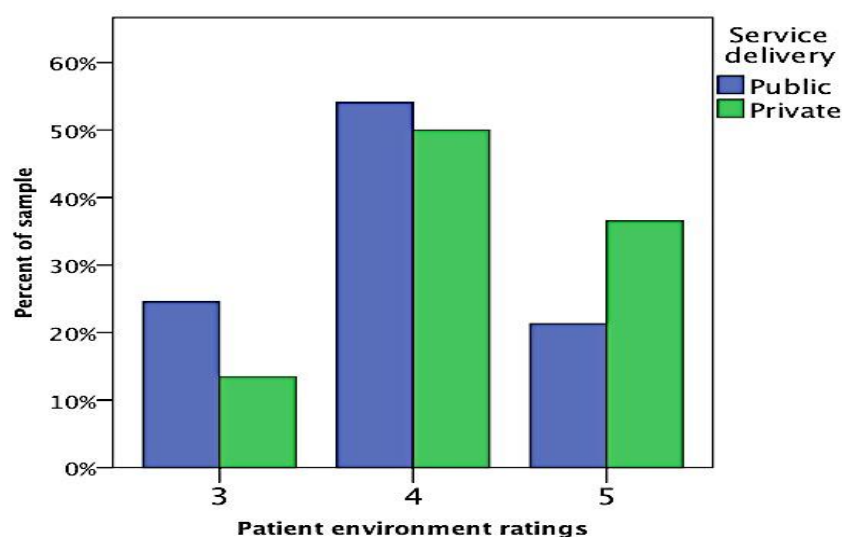
The patient environment ratings shown in Figure 1 and Table 1 are for the two alternative delivery types of cleaning services, namely those provided from public and private suppliers.

Patient environment ratings can range from 1 (unacceptable)¹⁰ to 5 (excellent) for each hospital. The size of the samples representing public and private can be seen in Table 1 and relate to 2008 performance – the last year for which required data is available.

“Patient environment is an integral part of patient experience and important to supporting patient recovery and staff morale. Evidence that shows improved results for patient environment, even if not definitive, cannot be ignored by any Health Service aiming for excellence.”

Mathew Custance
KPMG

¹⁰ Due to the small number of facilities scoring lower than 3, hospitals scoring 1 & 2 are converted to 3 to allow for more effective inferential statistical analysis.

Figure 1: Distribution of patient environment ratings by delivery type (2008)**Table 1: Proportion of sample in respective patient environment ratings by delivery type (2008)**

Patient Env. ratings	Public (% of n)	Private (% of n)
5 - Excellent	21.3%	36.5%
4 - Good	54.1%	50.0%
3 - Acceptable	24.6%	13.5%
Sample size	61	52

The overall picture that is emerging from Figure 1 is that the patient environments in hospitals where cleaning is provided privately are more likely to be assessed as 'excellent', and less likely to witness lower ratings in the 'acceptable' or worse categories, when compared to facilities where cleaning is provided in-house by the NHS. There is reasonable evidence to expect this is a result of the delivery type applied¹¹.

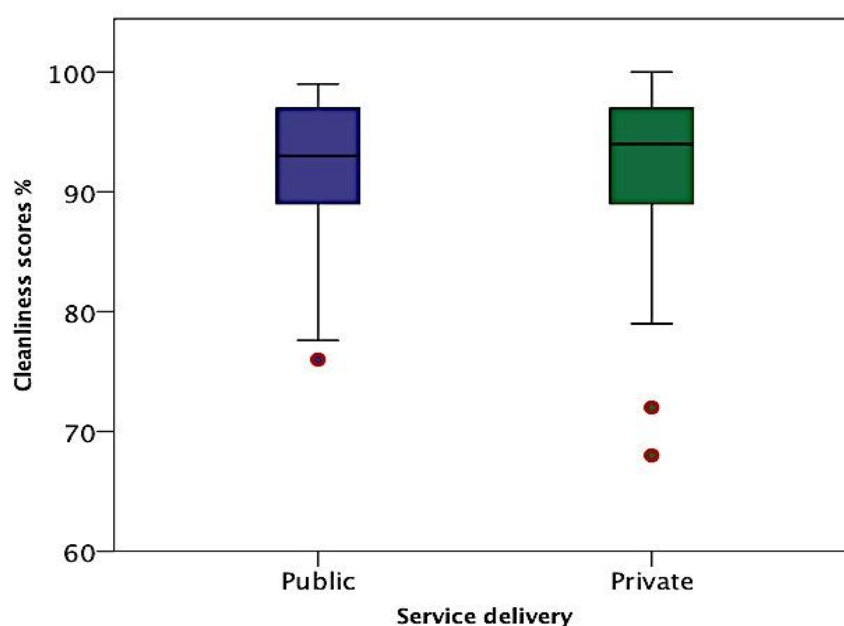
Cleanliness

Does the method of FM delivery for healthcare facilities have an impact on the cleanliness of the environment?

The cleanliness score (NSC) provides an indicator of the quality of the patient environment and the standards of FM services provided.

The cleanliness scores shown in Figure 2 and Table 2 represent the results for the two alternative delivery types of cleaning services, public and private. The data are for one year, namely 2008.

¹¹ Chi squared p-value= 0.124 (threshold required to accept statistical significant difference at 90% confidence level is 0.1)

Figure 2: Distribution of NSC scores by delivery type (2008) – boxplot**Table 2: NSC scores by delivery type (2008)**

Cleanliness	Public	Private
NHS NSC score %	92.10	92.07
St. Dev.	5.88	6.62
Sample size	62	53

The box-plot shows that both types of services delivery perform at a similar level and there is no reason to expect that one delivery type performs better with regard to this measure of performance¹².

How to read a Box-plot

- Box-plots are a simple way to represent the distribution of a continuous dataset
- The horizontal line running through the box is the median. Half of the data points in the dataset have a value higher than the median and half a value lower than the median
- The box itself contains the range which includes the middle 50 percent of the data points, i.e. the 2nd and 3rd quartiles lie within the box
- Outliers are represented by circles and stars
- Circles are moderate outliers between 1.5 and 3 box lengths away from the box end, while stars are extreme outliers more than 3 box lengths away
- Defining the minimum and maximum of the range as excluding the outliers, the lines extending down and up from the box to the horizontal lines represent the 1st and 4th quartiles respectively

¹² Independent sample T-test p-value = 0.982

Cost of Cleaning

Do more favourable environments come at a cost?

It is important to ask if the better performance of patient environment ratings in facilities where cleaning services are provided privately is the result of extra cost. We now examine the costs of providing cleaning services, focusing on whether the cleaning service is provided by the public or private sector.

“A slightly higher quality of service at a lower cost? Surely this makes a strong case for catering to be provided by the private sector or least to allow it to be assessed on a case by case basis rather than assumed as being excluded?”

Paul Smith
CMS Cameron McKenna

Figure 3: Distribution of Cost of cleaning by delivery type (£ per m² per annum: 2008) – boxplot

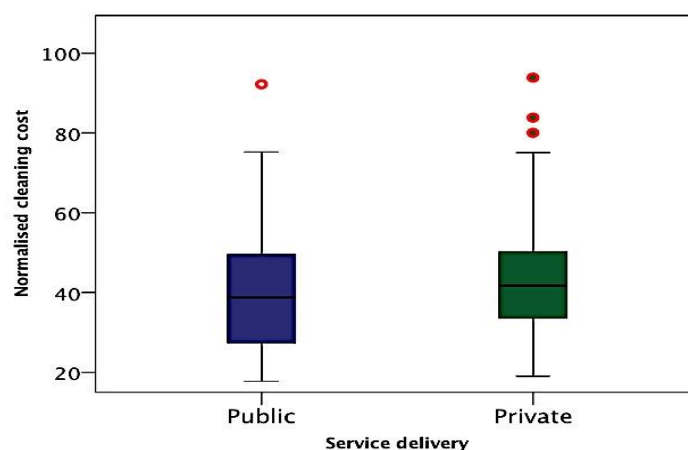


Table 3: Cost of cleaning by delivery type (2008)

Cleaning cost	Public	Private
£/m ² per annum	39.72	43.68
St. Dev.	15.81	16.42
Sample size	57	49

Figure 3 shows that facilities where cleaning is provided in-house have a lower median cost compared to facilities where cleaning is provided by private sector. However, based on these data we cannot assert conclusively that either of the delivery types is more expensive than the other¹³.

¹³ Independent sample T-test p-value = 0.208

Catering Ratings

Does the delivery type of catering operations influence the standards of the service?

We have used existing data on catering ratings relating to 2008 performance.

The catering ratings shown in Figure 4 and Table 4 are for public and private catering service provision. Similar to the patient environment ratings, the catering ratings range from 1 (unacceptable) to 5 (excellent) for each hospital. The respective sample sizes for the alternative delivery types can be seen in Table 4.

Figure 4: Distribution of catering ratings by delivery type (2008)

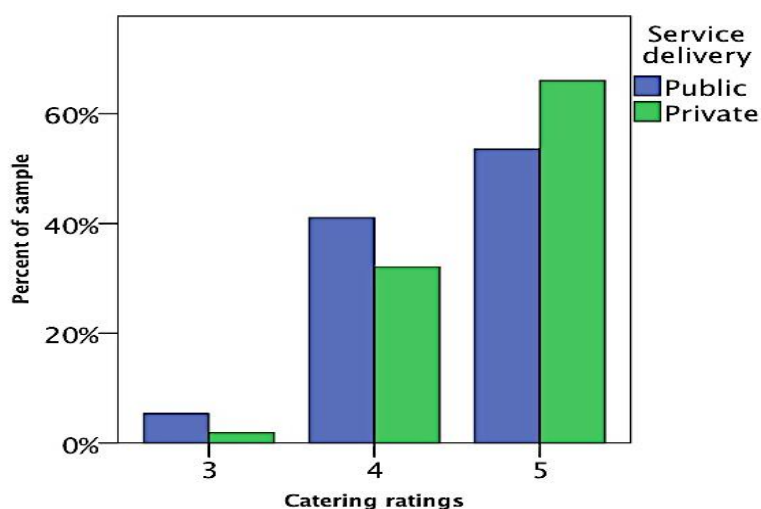


Table 4: Proportion of sample in respective catering ratings by delivery type (2008)

Catering ratings	Public (% of n)	Private (% of n)
5 - Excellent	53.6%	66.0%
4 - Good	41.1%	32.1%
3 - Acceptable	5.4%	1.9%
Sample size	56	53

The overall picture emerging from Figure 4 is that where catering services are privately provided, the hospital is more likely to have a higher rating in the 'excellent' category, and less likely to have lower rating in the 'acceptable' or worse categories when compared to facilities where catering is provided in-house by the NHS. However, the difference is not so great that you can conclusively say that one delivery type performs better than the other¹⁴.

¹⁴ Chi squared p-value = 0.332

Cost of Catering

Do high quality catering services come at a cost?

We have attempted to answer this with existing data on cost of feeding one patient per day using data from 2008.

Figure 5: Distribution of catering cost by delivery type (2008) – boxplot

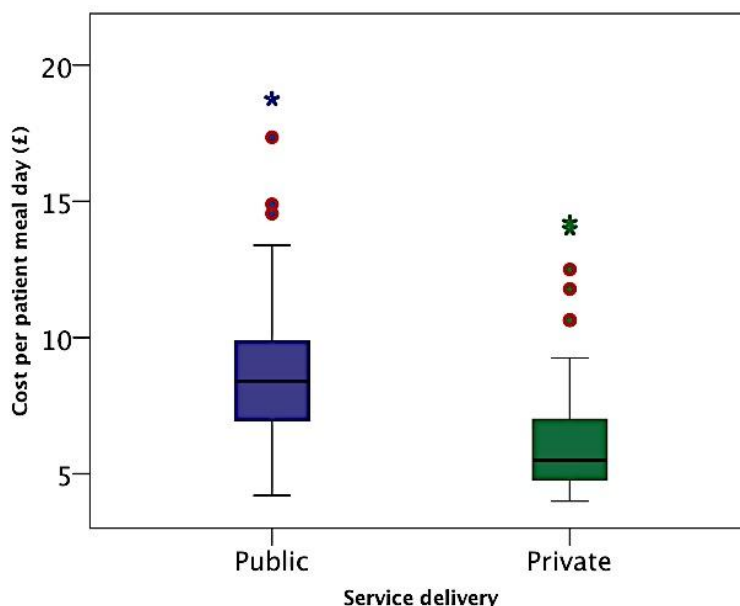


Table 5: Catering cost by delivery type (£ per patient meal day: 2008)

Catering cost	Public	Private
Cost per patient meal day (£)	8.81	6.55
St. Dev.	3.77	3.01
Sample size	54	49

Figure 5 illustrates that the range of costs per patient meal day from private sector providers is lower than public sector (i.e. in-house) provision. The average cost of catering is over £2 lower per patient meal day when it is provided by the private sector compared to the public sector (Table 5). Based on accessible data and our analyses, we can say with a high level of confidence that catering services are provided at lower cost by the private sector when compared to public providers¹⁵.

¹⁵ Independent sample T-test p-value =0.001

Concluding Remarks

This study has added to the emerging evidence base about how to get the best for patients in difficult economic times. The research presents the findings of an analysis conducted independently by UCL with prior agreement that results would be published without prejudice or influence to reinforce any viewpoint – whether pro or anti the use of the private sector in providing these services. We found that:

- Hospitals that have cleaning services provided by the private sector have better patient environment ratings than those where services are provided publicly. Despite this, there is no difference in cleanliness scores between hospitals where the two alternative delivery types are applied.
- There is no difference in the cost of cleaning between facilities where cleaning services are provided either by the private or the public sector.
- Food ratings in facilities where catering is provided by the private sector are not dissimilar to those where catering is provided by the public sector. However, the cost of catering services in hospitals where catering services are privately provided is significantly lower than where catering is delivered in-house.

“The UK Government’s launch of PF2 last year was a clear endorsement of the benefits that public private partnerships can have on the provision of infrastructure. Established views on this are polarised, and sometimes driven by vested interest, opinion and partial facts. In light of this it was interesting and indeed surprising to note the Government’s decision to remove the provision of soft services from future PF2 projects. I hope that the evidence on which this important decision was made will be published in due course as the objective data this report was based on reveals there is no damning case against such services as currently provided by the private sector, whether as part of PFI/PPP or out-sourced contracts.”

Andrew Edkins
University College London

The results are not presented as conclusive or definitive. They do, however, point to a case that questions the evidence on which the policy decision to exclude soft services from future PFI/PF2 was taken in December 2012.

The debate will continue. There will be those who will remain unconvinced by evidence based research such as this. For the remainder, we encourage others to do as we have, to see what empirical data exists in the public domain, analyse it robustly, and publish the results. This will allow us all to understand this complex and important issue of the right way to provide public service infrastructure.

Research Method

Sampling process

- The base dataset on UK healthcare facilities was obtained from Hospital Estate and Facilities Statistics (HEFS) website (www.hefs.ic.nhs.uk). The website is hosted by NHS Information Centre.
- The site level HEFS report 2007/08 forms the basis of the sample. The untouched HEFS site level report of this year covers 1,965 sites¹⁶.
- Eliminating all kinds of aggregated sites, those where patients are neither treated nor accommodated, or sites with no data, leaves 1,052 hospitals. These comprise of community hospitals, long stay hospitals, general acute hospitals, short-term non-acute hospitals, multi-service hospitals and specialist hospitals.
- All sites with any part of their facilities built before 1995 were excluded from the dataset using age asset profile data available at the site level.
- The sites which returned a zero and/or no data provided for our study variables were removed from the sample, as well as where method of services delivery was mixed¹⁷.

PFI facilities

- The PFI hospitals were identified with reference to the site level survey results used by the NAO in their 2010 study of the performance of PFI healthcare contracts. Access to this data was kindly provided by the NAO following an FOI request.

Delivery type of soft FM services (cleaning / catering)

- By cross matching the anonymised NAO survey at contract level, non-anonymised NAO data, as well as applying a deductive reasoning process with reference to other datasets (including PEAT), delivery type of services in PFI hospitals were established. This was required as around one third of PFI contracts do not have core soft FM services within their scope. In regards to Non-PFI hospitals, data on delivery type was already available via the Patient Environment Action Team data for 2010. Due to being unable to access comprehensive PEAT data for earlier years, we have assumed the delivery type indicated in 2010 to be the same as that in place in 2008, the latest year for which all cost and performance data is published at the site level in the HEFS reports.

Variables

- Performance data for the analysis was obtained from the NHS Information Centre and past National Patient Safety Agency reports.
- Patient environment ratings and catering ratings were produced by the National Patient Safety Agency and collected by its Patient Environment Action Team (PEAT) inspectors. The

¹⁶ It is subject to change by the NHS contributors and therefore may be amended.

¹⁷ That is where cleaning is provided partly by the public sector and partly by the private sector.

former assess non-clinical aspects of patient surroundings, taking into account organisation policies, cleanliness in various areas, infection control regimes, general environment and conditions in access / external areas. The latter takes into account all elements surrounding the service such as: availability of the menu, suitability of choices for patients, 24 hours availability of service, quality, quantity, temperature, presentation, service and support, availability of at least seven beverages etc. These ratings are produced using a self-assessment proforma completed by inspectors, most of whom are NHS employees (there should be a patient representative). The data was obtained from the NHS Information Centre and PEAT website (www.nrls.npsa.nhs.uk/patient-safety-data/peat/).

- Cleanliness score is a percentage score against the NHS National Specification for Cleanliness (NSC). The score is produced by self-assessment by NHS employees. The assessment is a pass or fail audit of 49 elements, such as cleanliness of fixtures & fittings and equipment, in the functional areas of the facility.
- The Cleaning cost measure was produced by dividing the headline service cost by the occupied floor area of the hospital (£/m²). The Cleaning cost is the cost to the NHS Trust as reported by that Trust in its Estates Return Information Collection (ERIC). For outsourced cleaning this cost refers to contract price; for in-house cleaning provision, to material, equipment and staff direct costs plus certain on-costs. For PFI hospitals, this is the part of the unitary charge apportioned to cost of cleaning provision under the PFI contract.
- The Catering cost data is provided in a normalised form in the HEFS site level report.

Analysis

- Standardisation of the dataset was performed through three methods: the standard score¹⁸ (z-scores); by quartiles¹⁹; by upper fence of quartiles and eradication of measurement errors (any sites with costs less than £4 for catering cost, and £15 for cleaning cost were removed from the dataset irrespective of the lower fence).
- Independent sample t-tests were used to establish whether the differences between the cleanliness scores, cleaning cost and catering cost in publicly and privately serviced facilities were statistically significant.
- Chi-squared analysis was used to establish whether the differences between the discrete patient environment / catering ratings in publicly and privately serviced facilities were statistically significant. To reduce the number of cells within the frequency table to aid more accurate analysis, the observations were grouped into three ranges of rating: 5, 4 and 3 or lower.
- Ninety percent confidence intervals were used for all tests.
- SPSS was used to undertake the statistical analysis.

¹⁸ Values being 2 or above, or -2 or below standard deviation from the mean are identified as outliers.

¹⁹ Q1 and Q3 are upper and lower quartiles respectively and their difference (Q3-Q1) is called the interquartile range or IQ. The following quantities are called fences (Lower fence = Q1-3*IQ and upper fence = Q3+3*IQ) are used for identifying extreme values in the tails of distribution.

Sample size and attrition

- The size of the samples used to analyse each variable was driven by the availability of data.
- Sampling attrition is demonstrated here by the example of cost of cleaning:
 - The untouched 2007/08 HEFS at site level reports on 1,965 sites
 - Removing all forms of aggregated sites and sites where patients are neither treated nor accommodated or sites with no data reduces this to 1,052
 - Removing all sites with any part of the age asset profile dated before 1995 (or with missing data for age) reduces this to 136
 - Of these 136, twenty one had cleaning provided by a combination of public and private sector, so were removed (or cleaning service type data was not available)
 - 9 sites were shown to have values outside our considered range of credible values so we removed based on our suspicion of measurement error
 - The remaining 106 became our base sample to be split between 'public' and 'private' delivery type.

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ISBN 978-1-903850-44-2

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